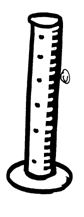
**Measure a Bean, Why?**

**Overview:** The purpose of this lab is for you to become familiar with the names and uses of the laboratory equipment. Two days are required to complete this experiment. All measurements and data should be placed on the attached data table.

**Day One Procedure:**

|  |  |
| --- | --- |
| 1. Number 5 beans 1-5 with a pencil 2. Measure the length and width of each bean with a ruler (use millimeters)  3. Determine the weight of each of your beans using a scale or balance.  4. Determine the volume of your all your beans.  a. Use a beaker to fill a graduated cylinder to the 10 ml mark.  b. Add all five beans to the graduated cylinder. To determine the volume of the beans, see how many ml the  water raised. (make sure to subtract the 10 ml you started with) 5. Place all five beans in attest tube, write your name on the test tube and fill it with 10 ml of water.  (This will be stored overnight.) | http://www.biologycorner.com/resources/balance.gif |

**Day One Questions:**

1. Describe the difference between a beaker and a graduated cylinder and which is more accurate?

2. A "unit" is a term that describes quantity. The unit of length measurements, for instance, is millimeters and centimeters. What are the units for mass (weight) and for volume?

3. Examine your ruler. How many millimeters are in a centimeter? \_\_\_\_\_\_\_\_\_

4. If a bean measured 2 cm, how many millimeters is it? \_\_\_\_\_\_\_\_\_\_\_

5. Describe the difference between mass and volume?

6. If a beaker is filled with 200 ml of water and a goldfish is added, the water level rises to 240 ml. What is

the goldfish's volume? (show your math)

**Day 2 - Procedure**

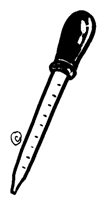
1. Remove the beans from the water and record their length and width of each bean on the data table.  
2. Determine and record the volume of the five beans  
3. Determine and record the weight of the five beans  
4. Split a bean in half, and use a pipette to put a drop of iodine on the bean. Describe what happens, these are quantitative observations.  
5. Complete the Extension Table and answer the analysis questions.

6. Make a graph comparing the volume of all five beans before and after soaking. Be sure to include the class data that was generated from your classmates.

**Day 2 Questions**

9. Describe how the bean's width and length change after soaking.

10. Describe how the bean's weight changed after soaking.

  
11. Describe how the bean's volume changes after soaking.

12. How do you account for these changes? (THINK and maybe search through your textbook for a reason and explanation.)

13. Label each equipment picture printed on this lab.

